

WHAT IS CLAIMED IS:

1. An optical detection method of determining the position of an object in a particular detection area of a surface, the method comprising:

5 - a preliminary step of disposing in the vicinity of said detection area and on the same side thereof relative to the object at least three elements including at least one emitter of light and at least one receiver of light adapted to cover the detection area, each emitter being
10 adapted to emit light in such a way that it does not hit said surface in the detection area, the method further comprises:

15 - a step during which one of said receiver measures the quantity of light reflected by the object when the object is illuminated by one of said emitter for at least two different emitter - receiver pairs,

16 - a step of calculating at least two characteristic values from said measured values, and

20 - a step of determining at least one position of the object by directly reading a table indexed by said at least two characteristic values, the content of said table being predetermined and set before said measurement step.

25 2. A method according to claim 1, wherein each emitter is associated with only one receiver and said characteristic values are equal to the values measured by each receiver when only said emitter is turned on.

30 3. A method according to claim 1, wherein, during said preliminary step, emitters and receivers are disposed in an alternating and regular arrangement and a characteristic value is calculated for each emitter by averaging the values measured by the receivers on each
35 side of said emitter when only said emitter is turned on.

4. A method according to claim 1, wherein, during said preliminary step, emitters and receivers are disposed in an alternating and regular arrangement and a characteristic value is calculated for each receiver by averaging the values measured by that receiver when the emitters situated on each side of said receiver are turned on successively.
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5. A method according to claim 1, wherein, the emitters and the receivers being disposed in any manner, a characteristic value is calculated for each emitter by calculating a function of the values measured by at least three receivers when only that emitter is turned on, the coefficients of this affine function being a function of the distance between each receiver and that emitter.
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6. A method according to claim 1, wherein said measurement step is repeated for each of said emitter - receiver pairs until a stable quantity of reflected light is measured.
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7. A method according to claim 1, wherein said predetermined table is obtained by a polynomial regression method from a number of preliminary measurements effected under the same conditions as apply to said measurement step.
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8. A method according to claim 1, wherein said surface is substantially plane, and wherein, during said preliminary step, there are disposed in a single line emitters and receivers of light having an emission axis, respectively a reception axis, substantially parallel to said particular detection area.
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- 35 9. A method according to claim 1, wherein said detection area is rectangular and the emitters and receivers are

disposed in the vicinity of only one side of said rectangular area.

10. A method according to claim 1, wherein the light
5 emitted by the light emitters is ordinary non-coherent
light.

11. A method according to claim 10, wherein the wavelength of the light emitted is in one of the
10 following ranges of wavelengths: UV, visible, infrared.

12. A method according to claim 1, wherein said detection area comprises a set of elementary areas each associated with a given function so that any position of the object
15 in an elementary area activates the function associated with that elementary area.

13. An optical detection device for determining the position of an object on a particular detection area of a
20 surface, said device comprising, disposed in the vicinity of said particular area, and on the same side thereof with respect to the object, at least three elements including:

- 25 at least one emitter of light adapted to emit light so that it does not hit said surface in the detection area, and

- at least one receiver of light adapted to cover said detection area and to measure a value representative of the quantity of light reflected by the object,

30 said device further comprising control means for turning on said emitter and processor means adapted:

- to obtain and store for at least two different emitter - receiver pairs the quantity of light reflected by said object and measured by said receiver when the
35 object is illuminated by said emitter,

- to calculate at least two characteristic values from said measured values, and

- to determine at least one position of the object by directly reading a table indexed by said characteristic values, the content of said table being predetermined and set before said step of obtaining the 5 quantity of light reflected by said object.

14. A device according to claim 13, wherein each emitter is associated with only one receiver and said characteristic values are equal to the values measured by 10 each receiver when only said emitter is turned on.

15. A device according to claim 13, including emitters and receivers disposed in an alternating and regular arrangement and the emitter calculates a characteristic 15 value by averaging the values measured by the receivers on each side of said emitter when only said emitter is turned on.

16. A device according to claim 13, the device having 20 emitters and receivers disposed in an alternating and regular arrangement and a characteristic value is calculated for each receiver by averaging the values measured by that receiver when the emitters situated on each side of said receiver are turned on successively.

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17. A device according to claim 13, wherein, for the emitters and the receivers being disposed in any manner, the processor means calculate a characteristic value for each emitter by calculating a function of the values 30 measured by at least three receivers when only that emitter is turned on, the coefficients of this affine function being a function of the distance between each receiver and that emitter.

35 18. A device according to claim 13, wherein the processor means are adapted to repeat said measurement step for

each of said emitter and receiver pairs until a stable quantity of reflected light is measured.

19. A device according to claim 13, wherein said
5 predetermined table is obtained by a polynomial regression method from a number of preliminary measurements effected under the same conditions as apply to said measurement.
- 10 20. A device according to claim 13, wherein said surface is substantially plane, and wherein said emitters and receivers are disposed in a single line and have respective light emission and reception axes substantially parallel to said particular detection area.
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21. A device according to claim 13, wherein said detection area is rectangular and the emitters and receivers are disposed in the vicinity of only one side of said rectangular area.
- 20 22. A device according to claim 13, wherein the light emitted by the light emitters is ordinary non-coherent light.
- 25 23. A device according to claim 22, wherein the wavelength of the light emitted is in one of the following ranges of wavelengths: UV, visible, infrared.
24. A device according to claim 13, wherein said
30 particular area comprises a set of elementary areas each associated with a given function so that any position of the object in an elementary area activates the function associated with that elementary area.
- 35 25. A device according to claim 24, wherein said particular area corresponds to an input area and each of the elementary areas corresponds to a key.

26. A data input terminal including a device according to claim 13.

5 27. The use of a detection method according to claim 1 or a detection device according to claim 13 to detect the displacement of an object or to measure the speed of displacement of an object.